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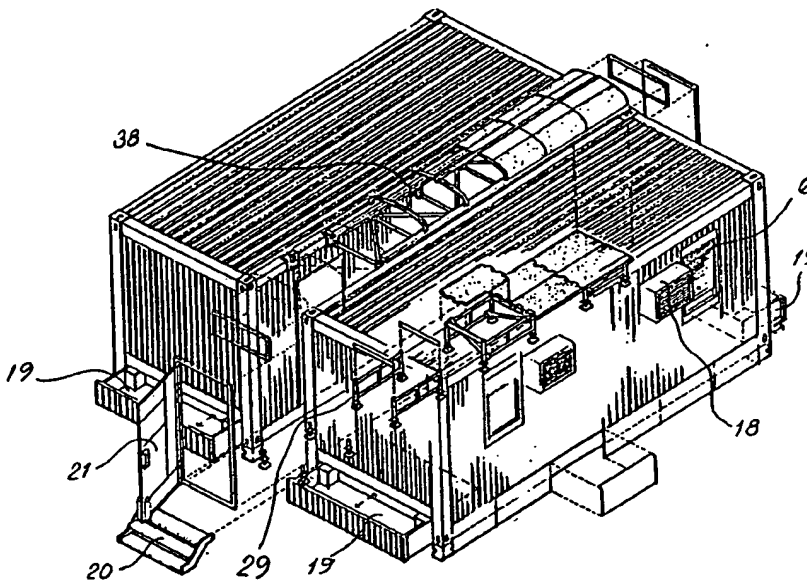
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/SE93/00674 <b>(22) International Filing Date:</b> 13 August 1993 (13.08.93)  <b>(30) Priority data:</b> 9202459-5                      27 August 1992 (27.08.92)                      SE  <b>(71)(72) Applicant and Inventor:</b> NEMET, Istvan [HU/SE]; Koristgatan 20, S-215 84 Malmö (SE).  <b>(74) Agents:</b> STRÖM, Tore et al.; Ström & Gulliksson AB, Box 4188, S-203 13 Malmö (SE).  <b>(81) Designated States:</b> AT, AU, BB, BG, BR, BY, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).		<b>Published</b> <i>With international search report.</i> <i>In English translation (filed in Swedish).</i>

**(54) Title:** TRANSPORTABLE DWELLING UNIT**(57) Abstract**

Transportable, heat insulated and completely equipped dwelling unit (1) based upon an ISO container and designed for being connected to one or several corresponding dwelling units (1) to form a united group of separate dwelling units. Each dwelling unit is divided into two separate rooms (3, 4), each room comprising a window (6), entrance doors (5), beds (7), seats (12). Each dwelling unit (1) being connectable by means of mounting components with an adjacent dwelling unit (1), thereby forming between the dwelling units a covered connection corridor (14), comprising a roof construction and a floor construction for interconnecting said dwelling units (1) at the upper portion and the bottom portion respectively, thereby forming said connection corridor (14) between said dwelling units, said connection corridor comprising floor, roof and gables with doors. The partition wall construction (2, 15, 16) comprises water supply, sewerage and sanitary spaces (16) which are separated from each other and each comprises WC (10), wash basin (9) and shower (8). The water supply, sewerage and sanitary spaces are connected with and serve each one of said dwelling rooms of the dwelling unit (1). The mains (23, 24) for water and waste are disposed in or underneath the bottom construction of said dwelling unit (1) and are connected with said water supply, sewerage and sanitary spaces, and are connected outside the dwelling unit to external water and waste pipes.



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## TITLE OF INVENTION: TRANSPORTABLE DWELLING UNIT

5 The present invention relates to a transportable,  
heat insulated, completely equipped dwelling unit based  
upon an ISO container and designed for being connected to  
one or several corresponding dwelling units to form a  
united group of separate dwelling units.

10 The frequency of travelling, which during the last  
decades has been subject to a continuous increase, has in-  
volved continually increasing demands on the availability  
of temporary accomodation for shorter or longer periods.  
The demand for accomodation during longer of shorter  
15 periods has been accentuated by the migrations resulting  
from political revolutions, which have taken place in  
Eastern Europe, as well as by the streams of refugees  
caused by warfare and disturbances in different parts of  
the world. The increasing stream of labour crossing nation-  
al borders for working abroad for shorter of longer periods  
20 has also involved an increase of the demand for temporary  
accomodation facilities at costs that are considerably  
lower than the costs for more or less luxurious hotel  
rooms.

25 In the first place already existing premises like  
schools, gymnasiums, barracks ets have been used for the  
reception of refugees, but with an increasing stream of re-  
fugees those existing resources have rapidly been used up  
and it has become necessary to resort to temporary sol-  
utions involving arrangements with barracks, work barns etc  
30 in order to provide for temporary accomodation of refugees.  
In many cases the stream of refugees has been so great that  
it has proved necessary to provide accomodation by means of  
hastily erected camps.

35 One object of the present invention is to provide  
easily transportable, heat insulated and completely fitted  
dwelling units, which are based on ISO containers, each

dwelling unit comprising two separate night lodgings, said dwelling units being easily interconnectable to form a united group of separate dwelling units, and in which all components required for the mounting of the dwelling units are included in the respective unit. Another object of the invention is to provide dwelling units which are well suited for permanent disposition and interconnection with corresponding units, e.g. at gasoline stations, larger parking areas etc, for providing night lodgings for travellers and which are well suited for the use of electronical key-and-payment systems, so that the traveller will have to pay only for those hours during which the lodging has been used.

The objects specified above are obtained by using dwelling units of the kind specified in the appended claims.

The invention is described below with reference to embodiments illustrated on the appended drawings, of which fig 1 schematically illustrates a dwelling unit according to the invention, divided into two rooms, each for two persons,

fig 2 shows a basic unit consisting of two dwelling units which are connected to each other by means of a connection corridor,

fig 3 illustrates the connection of three dwelling units by means of two connection corridors,

fig 4 illustrates an arrangement including five basic units arranged in a group and associated with each other,

fig 5 illustrates the use of the dwelling units according to the invention, connected to each other to form a larger structure,

fig 6 shows a horizontal section through a basic unit comprising two dwelling units, connected to each other by means of a connection corridor, one of the dwelling units included in the basic unit being shown only partly,

fig 7 is a vertical section through the basic unit of fig 6, taken as shown by arrows A-A,

fig 8 is a vertical longitudinal section through a dwelling unit, taken as indicated by arrows B-B in fig 6,

5        fig 9 and 10 disclose a horizontal section and a vertical section, respectively, through a basic unit, corresponding the sections of fig 6 and 7 and are particularly intended for illustrating the piping for the heating, water and sanitation installation,

10        fig 11 is a perspective view illustrating the mounting of two dwelling units together by means of a connection corridor, which can be assembled by interconnecting building components, and

15        fig 12 is a perspective view shown in enlarged scale, which particularly illustrates the assemblage of the connection corridor.

Fig 1 is a schematic perspective view of a dwelling unit 1 according to the invention, based on an ISO container, which is divided by means of a partition-wall 2  
20        into two separate rooms 3, 4 having individual doors 5 disposed in one of the longitudinal walls of the container and windows 6 disposed in the opposite longitudinal wall. Internally the container is provided with heat insulating as well as sound insulating layers. As shown more clearly  
25        in figures 6-10, each room is equipped with two beds 7, a shower cabinet 8, wash basin 9 och WC 10, a table top 11 disposed beneath the window, two chairs 12 which may be turned away, a small wardrobe 13 and all heating, water and sanitary plumbing and electrical equipment with matching  
30        electrical wiring. Each room 3, 4 is dimensioned for two grown up persons, as indicated in fig 1. In other respects the dwelling unit 1 is designed in accordance with the ISO standard, thus comprising lifting armature and channels for introducing the forks of a fork lift truck, and is in all  
35        respects designed so that the dwelling unit 1 can be moved

and transported by lorry, by fork lift truck, railway truck, ship and by transport aircraft. From transportation point of view the dwelling unit 1 according to the invention functions as any known ISO container.

5           According to the invention two dwelling units 1 are interconnected by means of a connection corridor 14 assembled from building components. Interconnected by means of said connection corridor, two dwelling units form a basic unit, as illustrated in fig 2, comprising accomoda-  
10           tion for eight grown up persons.

          By means of an additional connection corridor, the basic unit may be connected with a third dwelling unit, as illustrated in fig 3, this combined unit providing accomo-  
          dation for twelve persons.

15           Several basic units may be located adjacent each other in a desired pattern to form a united group of dwelling units, as illustrated e.g. in fig 4, or be combined with individual dwelling units to form a continuous dwelling block, as illustrated e.g. in fig 5.

20           The dwelling unit according to the invention is illustrated in more detail in figures 6-10.

          Each dwelling unit is based on a ISO container, in the disclosed embodiment a ISO 1CC container, having the following main dimensions: length 6058 mm, height 2591 mm  
25           and width 2438 mm. The dwelling unit 1 is composed of a rigid parallelepipedical frame having a load carrying floor, walls and a roof of plating. The outer panelling may consist e.g. of corrugated metal plating, as in the il-  
          lustrated embodiment, but the panelling may also consist of  
30           plane plating. The dwelling unit 1 is internally provided with a heat insulating layer as well as with a sound insulating layer. On the inside the insulation is provided with an internal covering layer with attractive appearance and being resistant to damage and which can be cleaned  
35           easily.

The dwelling unit 1 is divided into two rooms 3, 4 of equal size. Two beds 7 are mounted in each room on the end walls of the dwelling unit, the lower one of said beds being fixed and the upper one hinged so that it can be felled downwards towards the end wall and form a back rest when the lower bed is used as a seat. The division of the dwelling unit into two rooms 3, 4 is obtained partly by means of a partition wall construction, which according to the illustrated embodiment consists of a partition wall 15 and two sanitary cabins 16, which are mounted adjacent each other at the longitudinal wall in which the entrance doors of both rooms are disposed. The sanitary cabins 16 preferably consist of complete, ready-equipped units, each comprising WC 10, wash basin 9 and shower cabin 8. Units of this kind are available on the market and may e.g. be of the mark INSTABLOCK.

Each room is also provided with an open wardrobe 13, and disposed above this one is a water heater 17 which is connected to the sanitary cabin 16.

Each room comprises a window 6 and beneath said window is a table top 11 and associated to this two chairs 12 which may be turned away towards the wall.

Mounted in the wall adjacent each window 6 is a complete air conditioning unit 18 which is housed within the respective room 3, 4 during transport of the dwelling unit 1. The opening in the wall in which the air conditioning unit 18 is to be mounted is closed by a covering plate during transport of the dwelling unit 1.

As mentioned previously, two dwelling units 1 according to the invention are interconnected by means of a connection corridor 14 assembled from building components. Each dwelling unit comprises space in which all building components necessary for mounting of said connection corridor 14 may be stored during transport of the dwelling unit. In the illustrated embodiment said space consists of

drawers 19 which may be drawn out of the dwelling unit. These drawers are dimensioned so as to accomodate all mounting components necessary for assembling said connection corridor 14 including entrance stair 20, entrance doors 21 with frames, vertically adjustable base plints 22 for said dwelling units etc. As shown in fig 8 and fig 11, said drawers are disposed in the bottom portion of the dwelling unit underneath the floor, one extendable drawer 19 being disposed at each end of the dwelling unit.

10 Necessary piping for waste 23 and for the supply of water 24 are disposed in the bottom of the dwelling unit 1, underneath the inner floor of the dwelling unit, and connected via internal piping for cold water 25, for hot water 26 and for waste 23 to the respective components in rooms 3  
15 respectively 4. The mains for water and for waste 23, 24 which are disposed in the bottom of the dwelling unit 1 are provided at the ends with retractable coupling pieces 27, 28, e.g. bellows, which during transport of the dwelling unit are retracted inside the limiting walls of the dwelling unit, but which in operation protrude outside the walls  
20 for connection with external water and waste pipes. The openings through which said connection pieces 27, 28 protrude are during transport of the dwelling unit 1 covered by a covering plate or by a lid. Electrical mains for current supply of the dwelling unit 1 are disposed in the bottom of the dwelling unit. Connection cables for the respective electrical equipment are drawn inside the outer covering in the respective room. Each dwelling unit 1 may  
25 thus be connected outside the dwelling unit to external main systems for water, waste and electrical supply.

30 The connection corridor 14 for interconnecting adjacent dwelling units is best illustrated in figures 11 and 12.

35 The connection corridor is thus composed of a number of prefabricated building components, comprising rectangu-



lar frames 29 from tubular profiles, spacing bars 30, braces 31, diagonal members 32, attachment profiles 33, floor plates 34 and roof plates 35, doors 21 including frames and bolts, pins, wedge members necessary for assembling the components.

By means of said buildings components a bottom frame of the cross bar type can be mounted, said bottom frame being supported by a number of vertically adjustable legs 36. Covering plates 34 are then positioned and attached to said bottom frame, thus forming the floor of said connection corridor. The dwelling units located adjacent each other are provided with longitudinal lists 37 which are attached by means of screws or the like to the upper, longitudinal edges running in parallel, adjacent each other. These lists 37 are then interconnected by means of a horizontal cross bar construction 31, 32, 33, composed of building components, said cross bar frame-work thus forming a rigid interconnection between both dwelling units 1. Mounted between said lists 37 is a number of preferably curved bars 38 forming roof frames for curved covering plates 35 which are attached and constitute the roof of the connection corridor. Door frames with doors 21 and entrance stairs 20 are mounted at the ends of the connection corridor 14. All building components, comprising the building components mentioned above, which are needed for mounting of the dwelling units 1 to the connection corridor 14, are thus during transport stored in said extendable drawers 19 in said dwelling units. The building components used are available on the market and do not constitute any part of the invention.

When the dwelling units have been assembled, the only remaining step to be taken is to connect water and waste pipes and electrical wiring to external water and waste systems and to external electricity supply system.

When a number of dwelling units 1 shall be delivered to a location site, the dwelling units are provided with all building components necessary for interconnecting said units by means of a connection corridor 14, said building components being stored in said extendable drawers 19 in the respective dwelling unit. The dwelling units are then transported by railway, by ship, by air freighter or by lorry or by a combination of these modes of conveyance to the locating site. A ground area which is as even as possible is preferably chosen as location. The ground area has preferably been pre-treated by earth excavation that may be required, so that substantially even location sites are provided. After arrival of the dwelling units 1 the plints 22 enclosed with said units are positioned and adjusted in the vertical direction into the same horizontal level. The dwelling units 1 intended to be connected to each other are then lifted into position by means of a fork lift truck or a mobile crane, after which the interconnection is carried out by mounting the connection corridor 14 which shall connect the dwelling units with each other. The interconnection, which is carried out as described above, does not require specialist man power, but can be carried out by unquiltified personnel. If specialized installers are used, the mounting of course is accelerated. The mounting also involves installation of the air conditioning units 18 enclosed with said dwelling unit. Each dwelling unit 1 is then connected to external water and sewer systems and to external electricity supply system. The installation is then ready for use.

If the need for the dwelling unit ceases, the connection corridor 14 and the air conditioning unit 18 are disassembled and stored in said drawers 19 respectively in rooms 3 and 4. The dwelling units 1 are then transported to a new mounting site or returned to their place of origin.

The embodiment discussed above with reference to the figures only constitutes an example of an embodiment according to the invention. However, different variants of the described embodiment are conceivable within the scope of the invention. According to one such variant the partition wall construction, in addition to two separate water supply-, seweridge- and sanitary spaces with WC, wash basin and shower, also comprises an electrical water heater and an air conditioning unit, serving each one of said two accommodation rooms. The air conditioning unit is in this case mounted in a recess in the longitudinal wall of the dwelling unit, between the windows, said recess extending inwardly and being covered by insulation. The recess can be closed by means of removable ventilation screens disposed essentially in the same plane as the outer surface of the longitudinal wall. The recess extends essentially over the entire height of the longitudinal wall and is extended sideways in the lower part in order to provide space for mounting therein of two waste pumps with an integrated waste grinding machine. Each one of said waste pumps is intended to serve one of said separate water supply-, seweridge- and sanitary spaces of the dwelling unit. One advantage by arranging the air conditioning unit and the waste pumps in the recess is that they are easily accessible for repair and maintenance.

The dwelling unit is supported on supporting legs of the screw type which are removable from the dwelling unit. Before the dwelling unit is lowered into position, said supporting legs are screwed into nuts or threaded sleeves which are rigidly attached at the corners of the bottom construction of the dwelling unit. At the free ends said screws are articulately attached to bearing plates, so that said bearing plates may be adjusted with respect to the inclination of the ground in order to obtain an even and distributed load against the ground. Vertical adjustment of the

dwelling unit for lining it up in the horizontal plane can be carried out by means of the supporting legs by screwing them into or out of said dwelling unit.

5 In the variant now described the mains for water and waste are not provided with attachment pieces of the bellow type at their outer ends. As in the variant described previously, the mains extend within or underneath the bottom construction of the dwelling unit. The main cable for electric current as well as said mains for water and waste  
10 are drawn along one side of the bottom construction and have their extreme ends positioned at the corners of said bottom construction and are easily available for connection under a protection cover.

The connection corridor used according to this variant is simplified compared to the embodiment described previously. When two dwelling units have been put in place and have been adjusted with respect to each other, angle irons  
15 are attached along the bottom construction by being fastened with screws into previously prepared holes. Box-shaped insulated floor panels are then attached adjacent  
20 each other on the angle bars. The upper portions of the dwelling units are interconnected by means of a number transversally extending bars on which roof panels are attached adjacent each other. The central roof panel comprises a light transparent cup through which the connection  
25 corridor is supplied with daylight. Door frames with doors are finally attached at the ends of the connection corridor.

During transport all mounting components are stored  
30 inside the dwelling unit in specially designed covers, which during the transport are stored in safe position e.g. underneath the beds of the rooms of the dwelling unit.

As should appear from the foregoing the dwelling unit  
1 according to the invention is used in order to rapidly  
35 providing temporary accomodation facilities for a great

number of people, e.g. for reception of refugees, at catastrophes, during temporary arrangements such as exhibitions, athletic events, festivals etc. The dwelling units 1 according to the invention may also advantageously be used in permanent arrangements, e.g. sleeping accomodation arrangements at gasolin stations or tourist establishments. The dwelling units 1 according to the invention also allow incorporation of a computorized electronic lock-and-surveillance system, which makes it possible to pay for lodgings only for the effective time during which the room has been occupied.

The invention, which has been described above with reference to illustrated and described embodiments, is not limited to said embodiments but can be subject to variations within the scope of the appended claims.

## CLAIMS

1. Transportable, heat insulated and completely equipped dwelling unit (1) based upon an ISO container and designed  
5 for being connected to one or several corresponding dwelling units (1) to form a united group of separate dwelling units, each dwelling unit being divided by means of a partition wall construction (2, 15, 16) into two separate  
10 dwelling rooms (3, 4), each comprising a window (6), entrance door (5), beds (7) and seats (12), said dwelling unit being connectable by means of mounting components to an adjacent dwelling unit (1) thereby forming a covered connection corridor (14) between said dwelling units, comprising floor, roof and end gables with doors,  
15 characterized in that said partition wall construction (2, 15, 16) comprises two water supply, sewerage and sanitary spaces, said spaces being separated from each other, each one comprising WC (10), wash basin (9) and shower (8), each one of said water supply, sewerage and  
20 sanitary spaces being connected with and serving one of said dwelling rooms of said dwelling units (1), and that all mains (23, 24) for water and sewer are drawn within or beneath the bottom construction of the dwelling unit (1) and extend into said water supply, sewerage and sanitary  
25 spaces and may be attached to external mains for water and sewer.

2. Dwelling unit as claimed in claim 1,  
characterized in that said partition wall construction (2, 15, 16) further includes an air conditioning  
30 unit which serves both of the dwelling rooms of said dwelling unit (1).

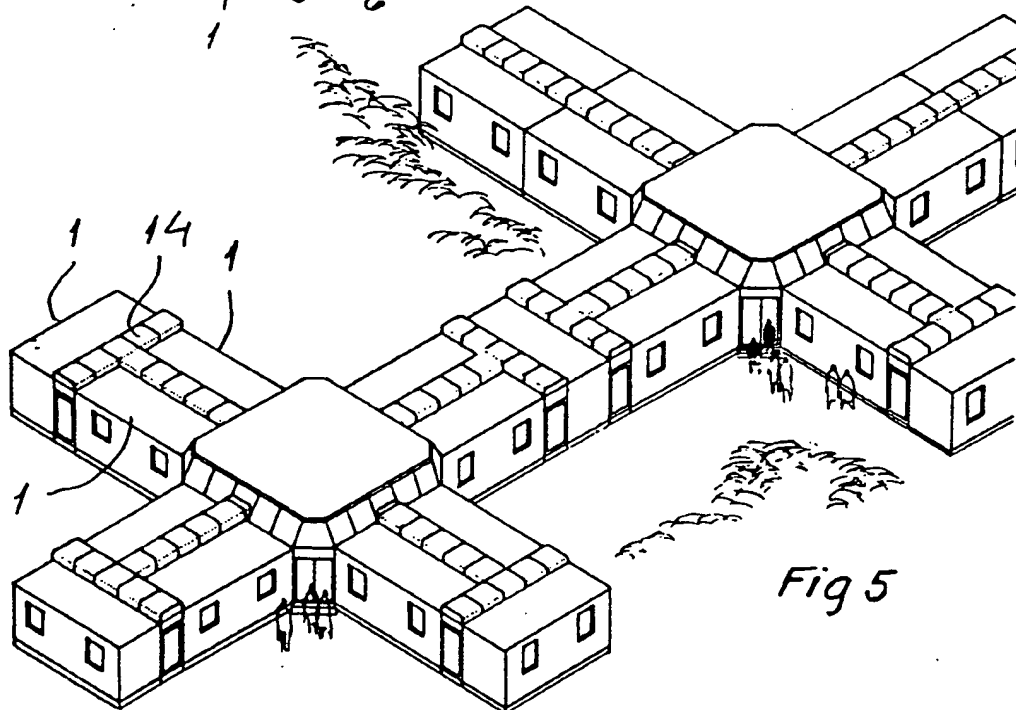
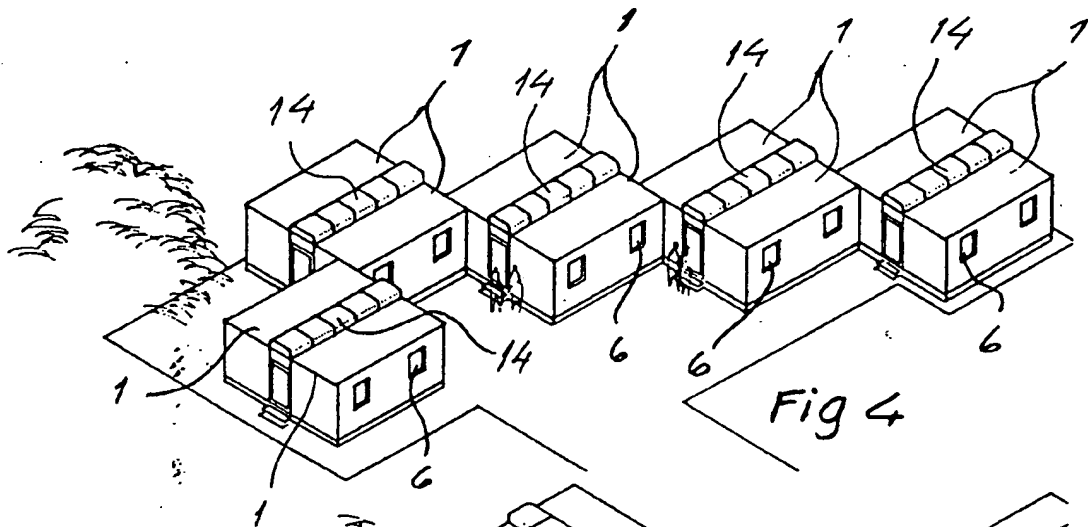
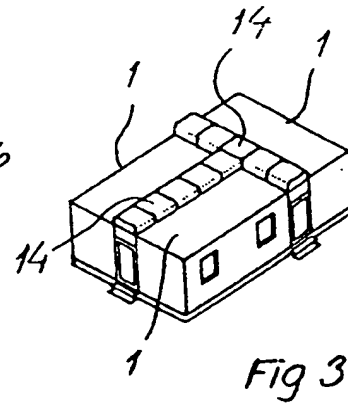
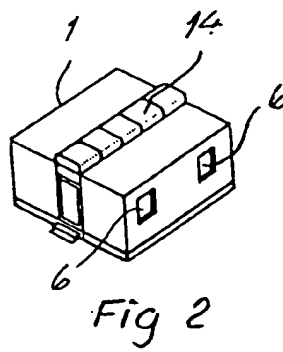
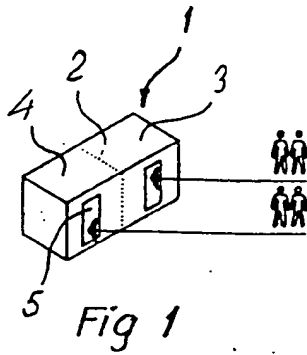
3. Dwelling unit as claimed in claim 2,  
characterized in that said air conditioning  
unit is mounted within a recess, formed between the windows  
35 (6) in the longitudinal wall of the dwelling unit, and ex-

tending inwardly of said dwelling unit, the walls of said recess being covered with insulation, said recess being closable by means of removable ventilation screens disposed essentially flush with the outer surface of the longitudinal wall.

5 4. Dwelling unit as claimed in claim 3, characterized in that said recess extends substantially over the entire height of said longitudinal wall, two waste pumps with an integrated waste grinding  
10 machine being mounted in the lower portion of said recess, each one of said waste pumps being intended to serve one of said water supply, sewerage and sanitary spaces (16) of said dwelling unit (1).

15 5. Dwelling unit as claimed in any of the preceding claims, characterized in that said mains (23, 24) for water and sewer being provided with connection pieces at the ends intended for external connection, said connection pieces having their ends opening at the short side of the dwelling unit.

20 6. Dwelling unit as claimed in claim 4, characterized in that said connection pieces consist of retractable bellows.





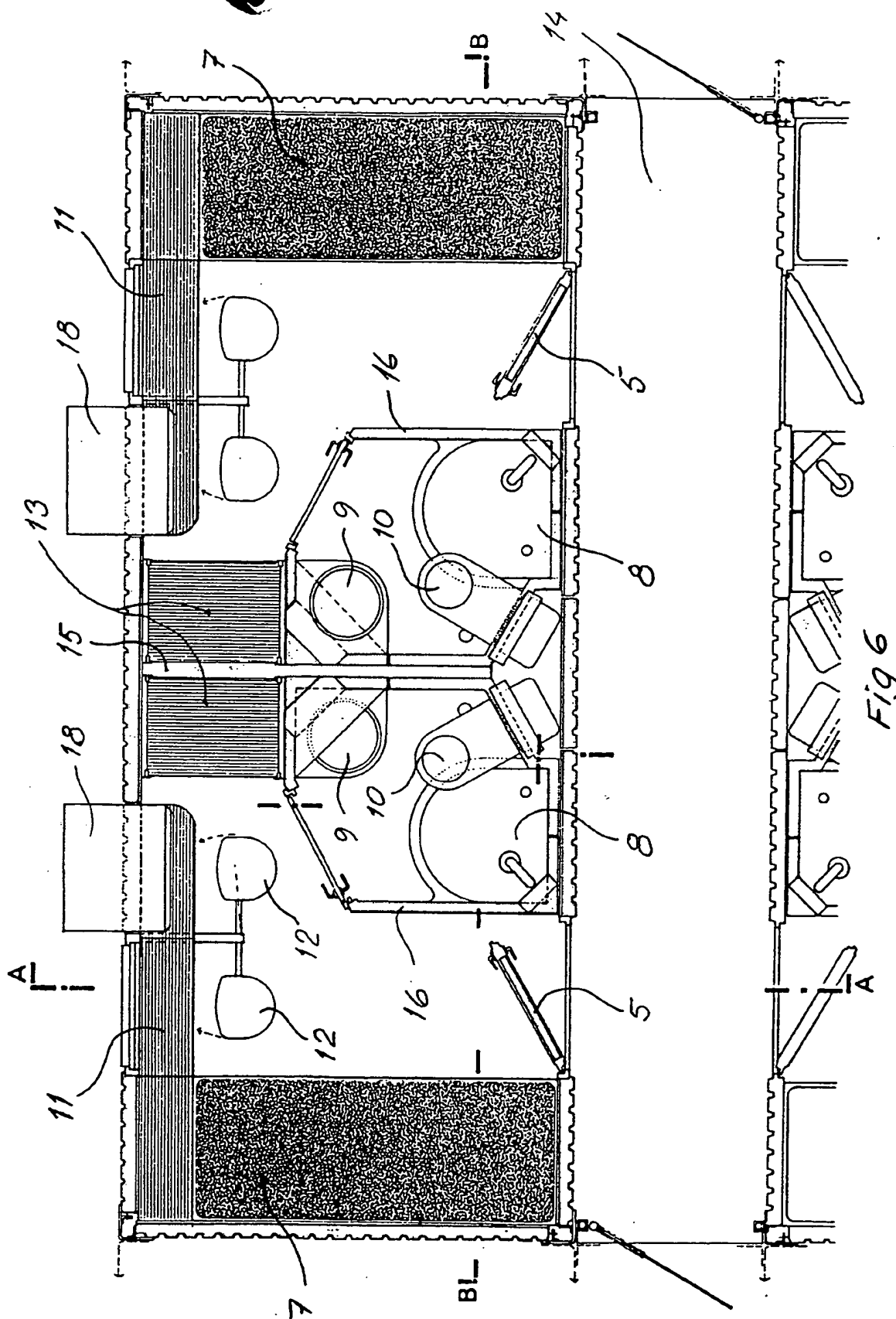


Fig 6

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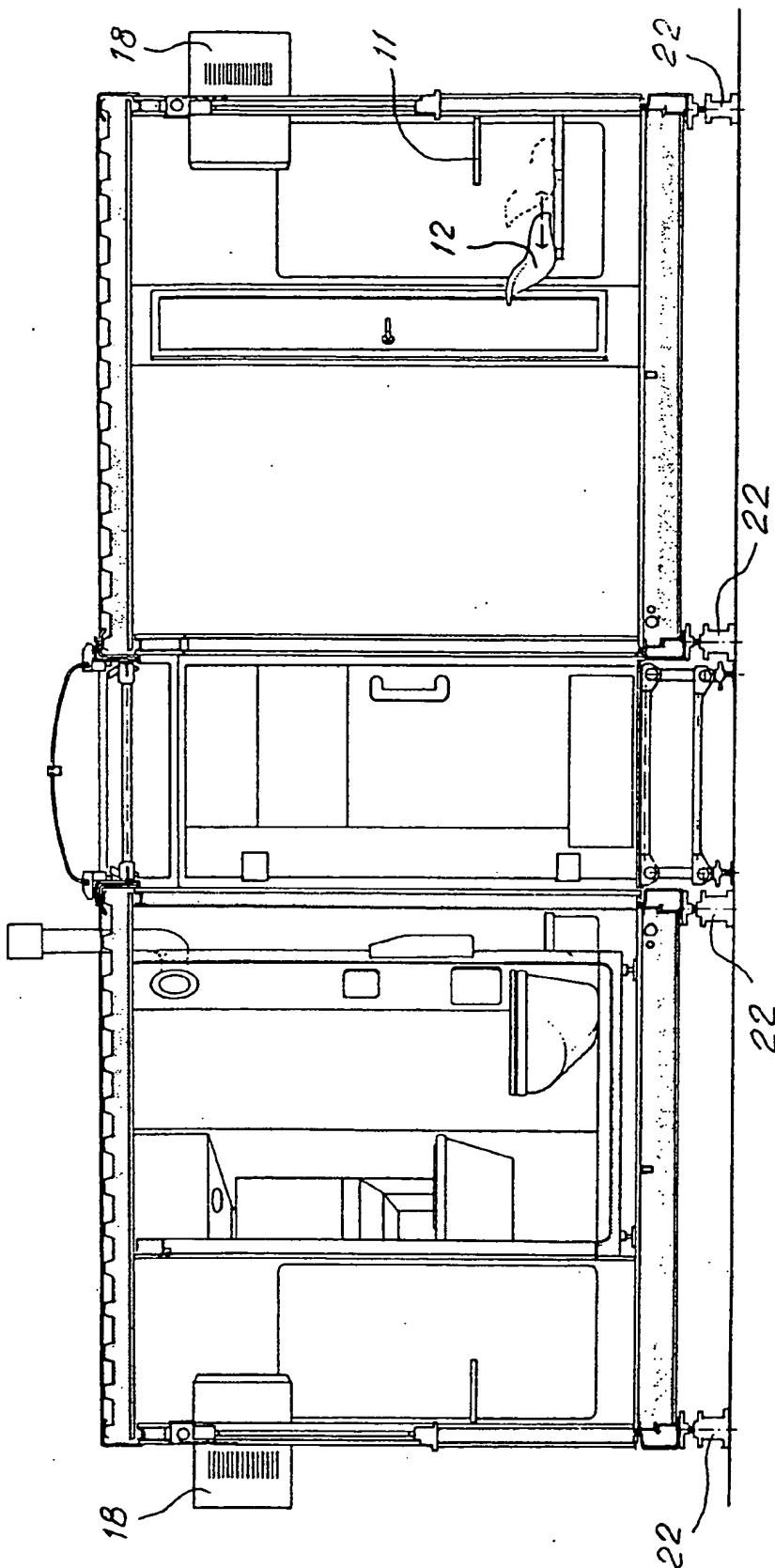


Fig 7

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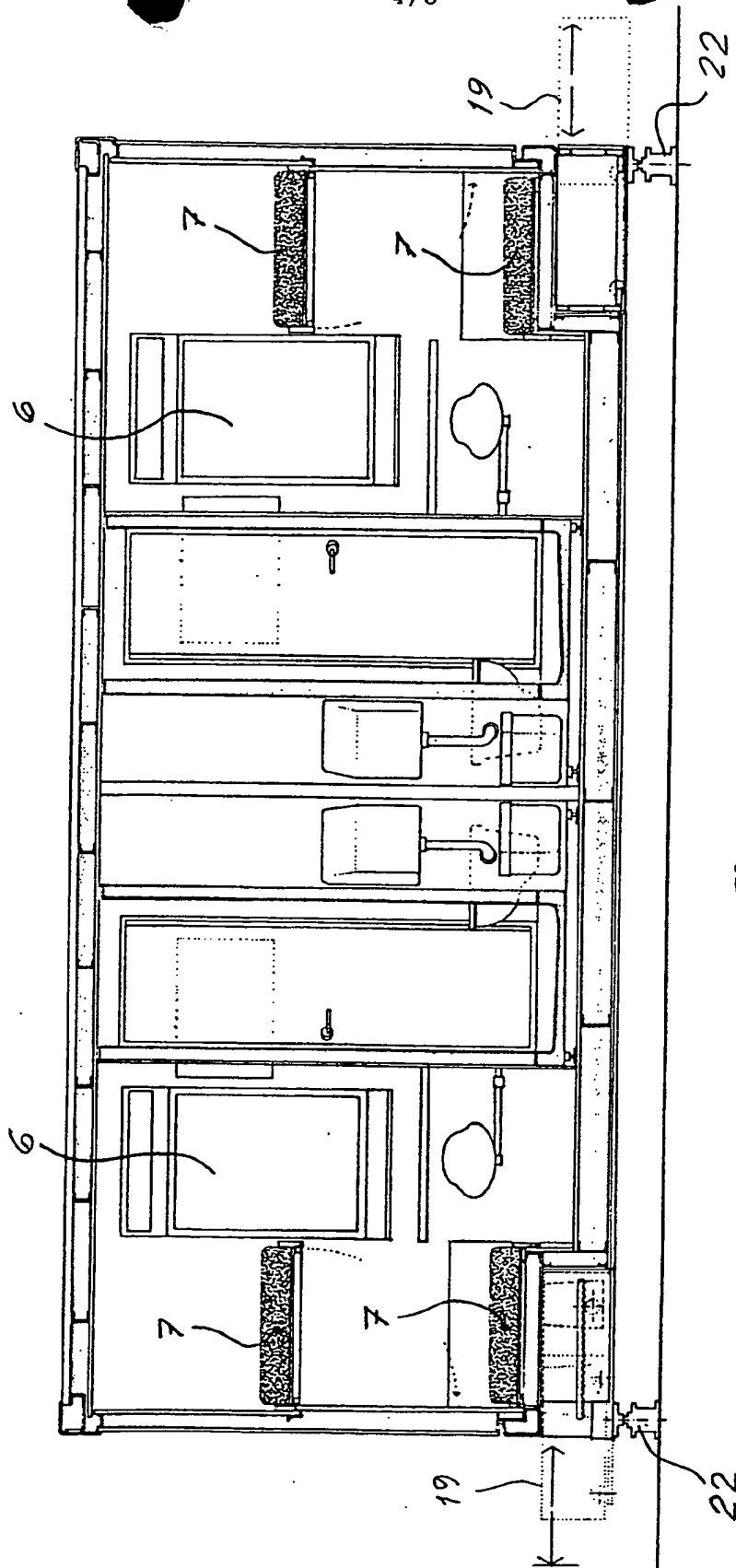


Fig 8

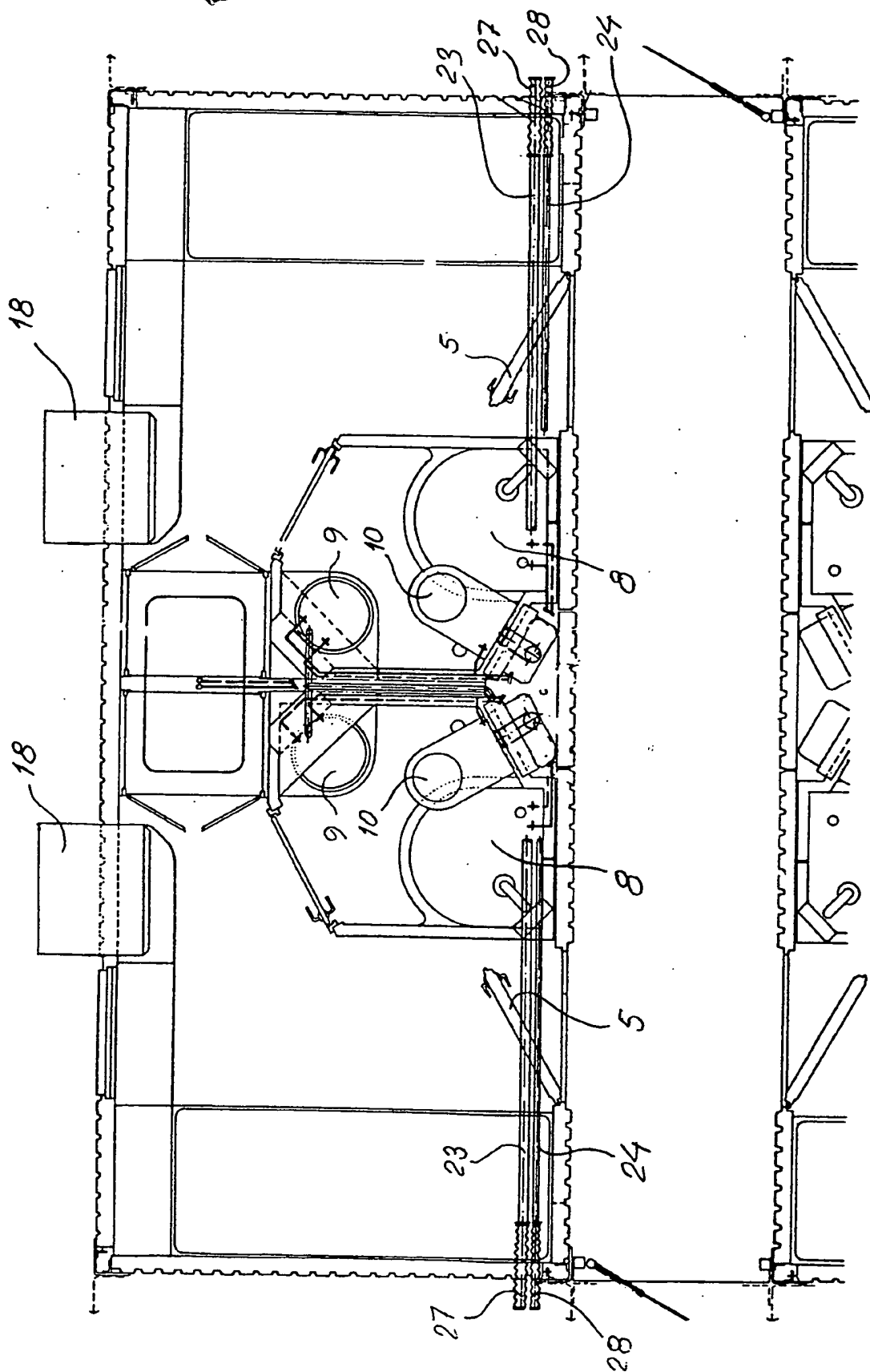
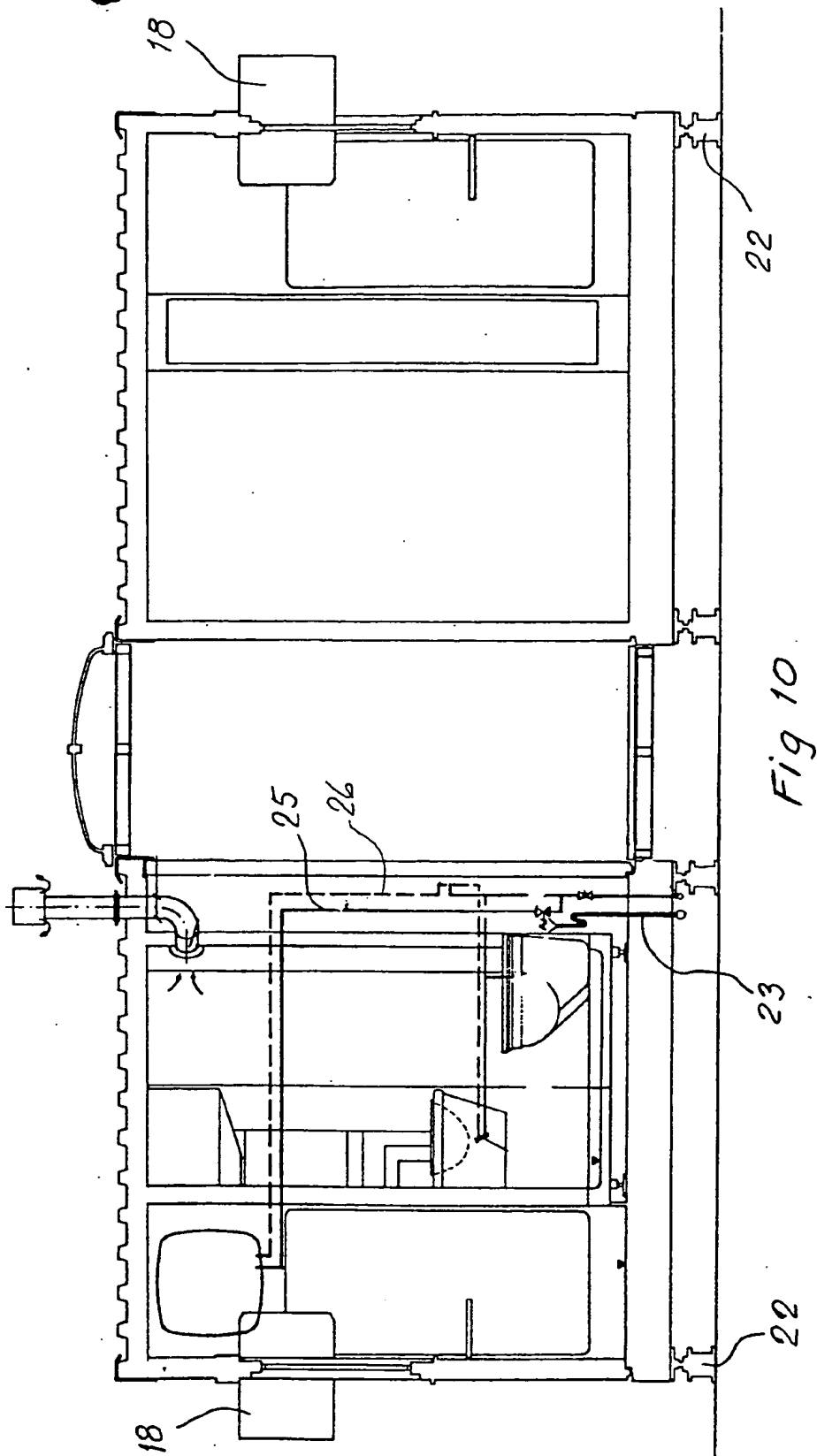


Fig 9

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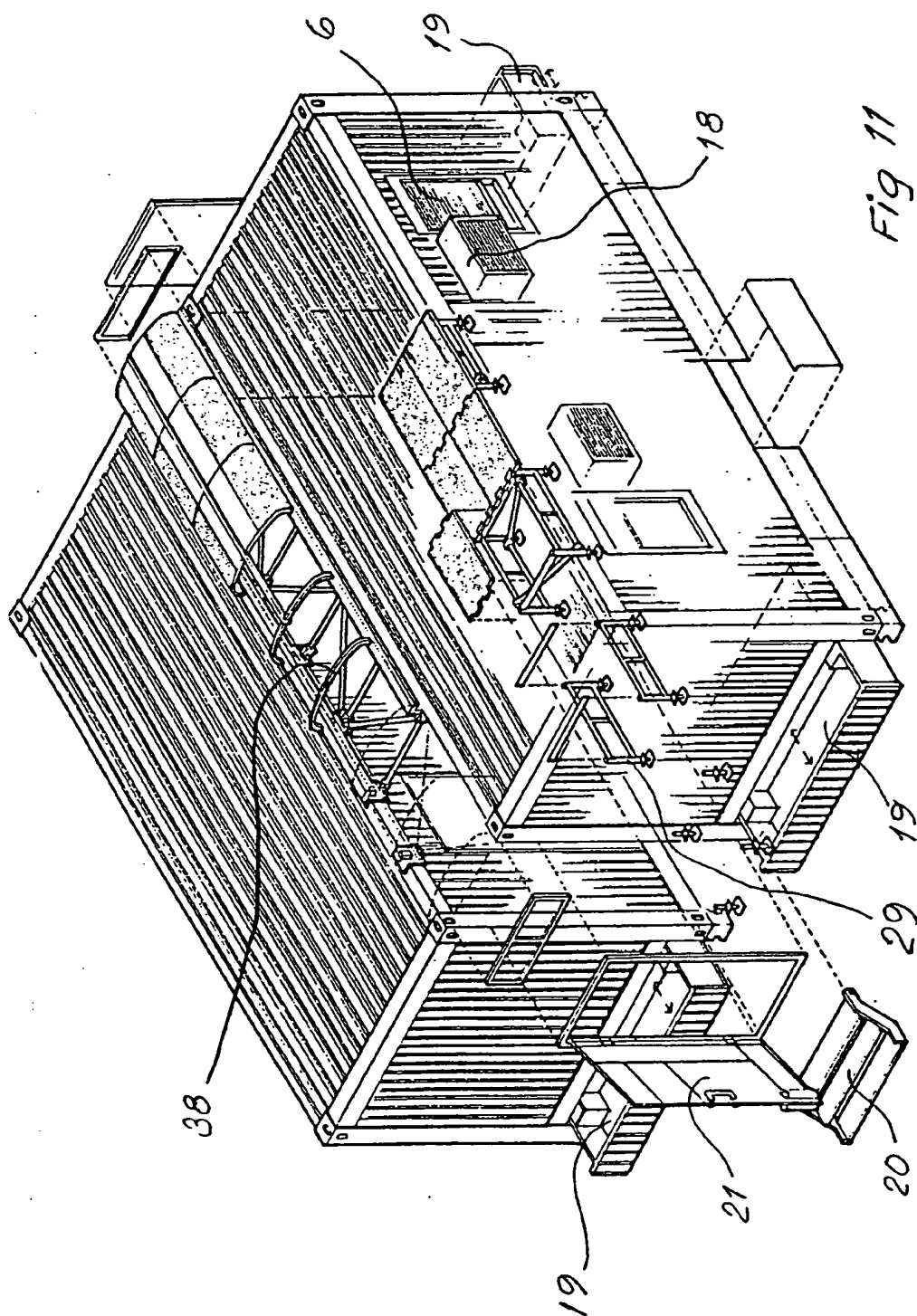


Fig 11

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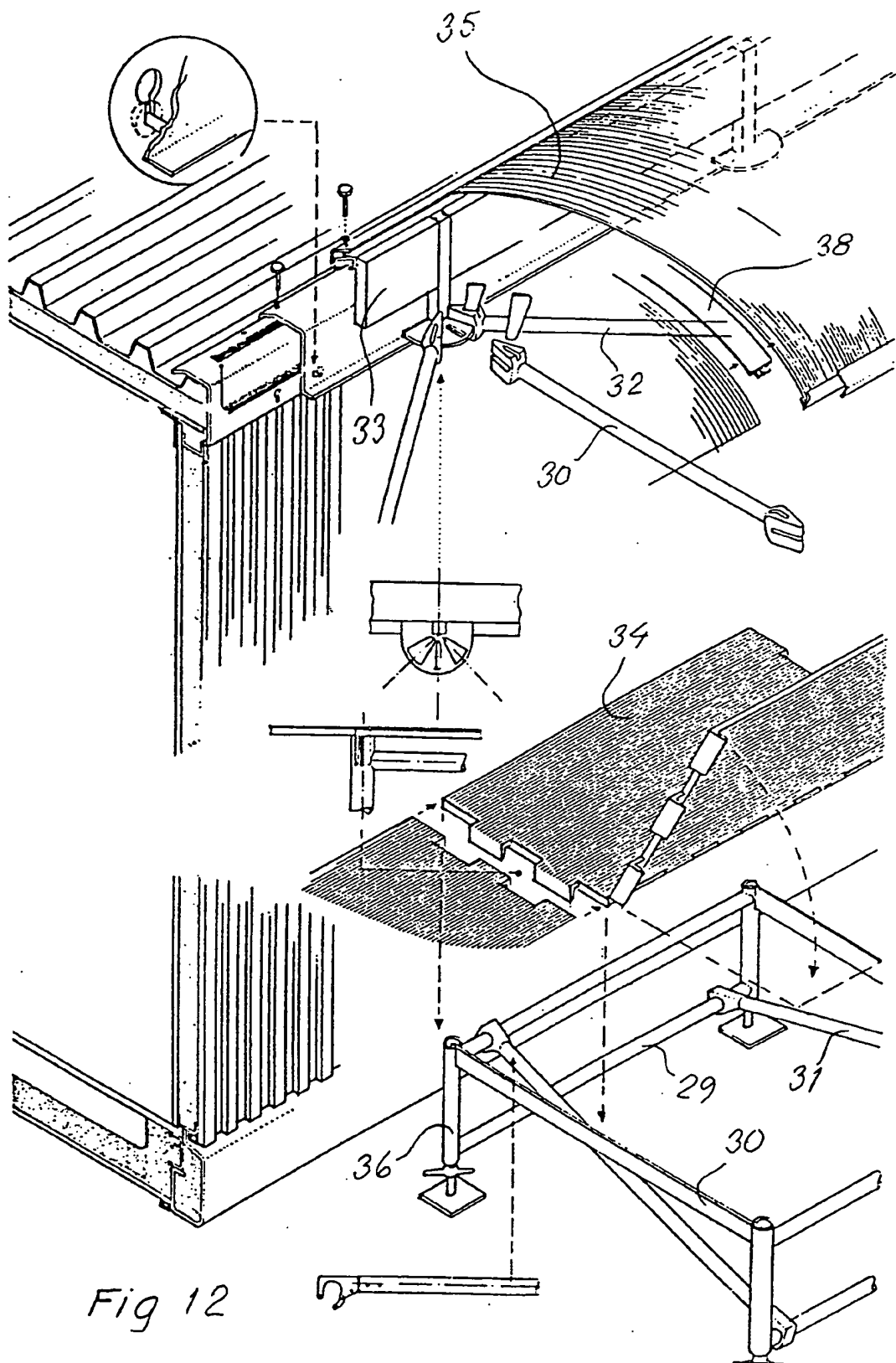


Fig 12

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## INTERNATIONAL SEARCH REPORT

National application No. .  
PCT/SE 93/00674

## A. CLASSIFICATION OF SUBJECT MATTER

IPC5: E04H 1/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC5: E04B, E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4255912 (J.M. KOVACS), 17 March 1981 (17.03.81), column 4, line 7 - line 22; column 4, line 39 - line 40; column 5, line 27 - line 37, figures 1-2 --	1-5
Y	SE, A, 8803002 (J.-Å. ELD ET AL), 1 March 1990 (01.03.90), figures 10-13, abstract -- -----	1-5



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

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Date of the actual completion of the international search

30 November 1993

Date of mailing of the international search report

01 -12- 1993

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

16/10/93

International application No.

PCT/SE 93/00674

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US-A-	4255912	17/03/81	CA-A-	1115920	12/01/82
SE-A-	8803002	01/03/90	NONE		